

REOPTIMIZATION OF THE OHIO STATE UNIVERSITY RADIO TELESCOPE FOR THE NASA SETI PROGRAM

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The Ohio State University radiotelescope is the second largest radio telescope in the United States, equivalent in collecting area (2200 m^2) to a 175-foot diameter dish. For the past 17 years it has been dedicated fulltime to SETI, and it is now being considered by NASA for selection as the NASA dedicated SETI observatory.

The telescope was originally designed, optimized, and used as an all-sky survey instrument to create detailed maps and catalogs of the radio astronomical sky. For the SETI program, some reoptimizations are required.

Right ascension tracking for one to two hours (depending on the declination) has been achieved by exploiting the exceptionally large f/d ratio of the telescope. The feed horns have been mounted on a large moveable, rubber-tired cart which is capable of a total motion of 100 feet. The cart can carry many horns, making possible simultaneous observations at many sky directions and frequency ranges.

Rapid declination movement and its automation will be accomplished through simplification of the existing braking system, and replacement of older mechanical sensors by modern electronic inclinometers and proximity detectors.

Circular polarization capability will be achieved through an increase in the number of horizontal wires in the reflector mesh, or addition of a finer mesh on top of the existing one.

The telescope has great inherent resistance to radio frequency interference, due to its ground-mounted feed horns and shielding by the large reflectors of half the horizon. The resistance has been recently increased further by installation of rolled-edges and diffraction-trapping gratings on the feed horns. If further shielding should be required, inexpensive side shields could be added to the telescope, making it a totally closed structure on all four sides.